

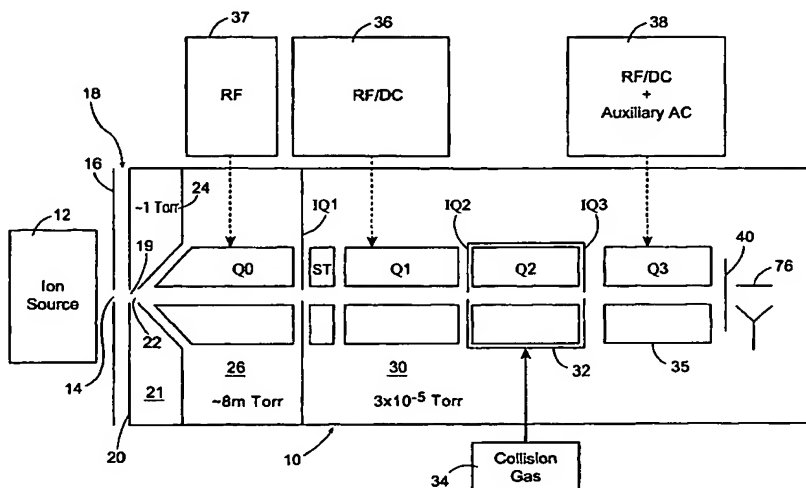
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(54) Title: FRAGMENTATION OF IONS BY RESONANT EXCITATION IN A LOW PRESSURE ION TRAP

(57) Abstract: In the field of mass spectrometry, a method and apparatus for fragmenting ions with a relatively high degree of resolution. The technique includes trapping the ions in an ion trap, preferably a linear ion trap, in which the background or neutral gas pressure is preferably on the order of 10^{-5} Torr. The trapped ions are resonantly excited for a relatively extended period of time, e.g., exceeding 50 ms, at relatively low excitation levels, e.g., less than $1V_{(0-pk)}$. The technique allows selective dissociation of ions with a discrimination of at least about 1 m/z at a practical fragmentation efficiencies. Apparatus and related methods are also disclosed for obtaining MS, MS², MS³ and MSⁿ spectrums at relatively high resolutions using the low pressure fragmentation technique.